GARDEN AND FOREST.

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Suggestions for Autumn Gardens.

EVERY true lover of a garden appreciates the feeling of Alfred Austen when he wrote that "autumn possesses the secret of careless grace beyond the spring, and no other season can match its orderly negligence and well-thought-out untidiness in form and color. Even to the garden proper the autumn adds such wonderful touches of happy accident that when it really comes a wise man leaves his garden alone and allows it to fade and wane and slowly and pathetically pass away without any effort to hinder or conceal the decay." But, after all, by making preparations beforehand we can assist the season in its perfect work. There is so much bright color everywhere in the foliage of every wood border and the herbage of every field that any attempt to compete with this flaming display is disheartening. But we can, at least, arrange our gardens so that they will keep in full harmony with the natural progress of the year, and while they may have the element of pathos which comes with the lengthening nights, they need not excite commiseration. The chilling arrest of active vegetable-life is as truly a part of the progressive order of nature as is the bursting forth of new life when the frost loosens its hold, and the preparation for the winter's sleep is often as beautiful as the spring awakening. And then there are many sturdy plants which show no symptoms of failing power, but keep on opening flowers and ripening fruit as if this was their happiest season. The list of hardy perennials which Mr. Manning gives in this week's issue shows that for mere floral display they can furnish all the material we need without the use of a hundred other plants which will make quite as brilliant a show with a little protection.

This calls to mind the fact that one of the principal charms of the garden is its constant change. The flowers of this season are beautiful in themselves, but they have the added charm of a distinct contrast with the flowers that have gone before. Perhaps no class of flowers makes such a strong appeal to the imagination as those of early spring, but a part of the delight we have in them comes from the fact that they are evanescent. The bright colors of a bed of Tulips, if they kept flowering all summer long, would soon tire us with the monotonous repetition of the same note, while everything about them kept changing. Visitors go many miles now to see a mass of well-selected Rhododendrons in bloom, but if the flowers remained the year through, as the foliage does, nothing would be more wearisome. We admire the exquisitely delicate tints of young unfolding leaves in spring because they soon change to a more sober green. We admire the splendors of our October woodlands because the foliage flames out for a brief season and does not burn before our eyes from May until November. The beauty of each season is evanescent, but it passes through new transformations every day and furnishes surprises all the year through.

This is one reason why set pattern beds made out of plants with vivid and variegated foliage become at last worse than wearisome to the eye. When once the figure is set on the grass its form and color is as unvarying as if it were a spread of painted oilcloth. While everything around them is taking on new forms and fresh colors, these beds remain without any growth, or sequence, or climax of effect. Surely, if plants have any beauty, it is the beauty of life that develops into some new attractiveness from youth to maturity and beyond. A set pattern from which the same colors stare all day long and all the summer through, is practically a lifeless thing in the midst of vicissitude and progress, and when the frost touches it ever so lightly, or blurs a single one of its lines, even the fictitious beauty it seemed once to have is gone and it remains through all the bright autumn days that follow a repulsive wreck.

BUT we can render our gardens a more positive service at this season than by keeping them free from such eyesores as decaying masses of tender plants. Of flowers there need be no lack, but why not arrange to bring some of the most striking of the natural effects of an American autumn within our enclosures? There is a choice among autumn fruits, and even among autumn leaves, and we venture to advise once more, as we have often urged upon planters, the selection of trees and shrubs with a view to the color of their foliage at this season and to the beauty of their fruit. The list of shrubs with fruit of attractive color is so extensive, and these fruits remain in their full beauty so long, that it would not be a difficult matter to make an autumn garden of shrubs alone which would be as interesting for its foliage and fruit as a spring garden could be for its foliage and flowers. The Barberries, the Prinos section of the Hollies, many kinds of Spindle-trees and the allied Bittersweets, Matrimony-vines, Viburnums and Cornuses, Climbing Honeysuckles, Coralberries and Snow-berries, Privets, Hawthorns and Wild Roses, and many more are now decorated with fruits in such a variety of form and color and persistence as to warrant their more extended use.

It is true that in selecting trees for planting, the autumn color of their foliage is often considered an advantage, but who has ever seen in any of our parks a group of different species of trees planted for the primary purpose of exhibiting the harmonies and contrasts of their autumn colors? We are learning something about the physiological changes which cause the breaking up of the pigments of the leaves to form new compounds, and we can trace to some degree the processes which make our woods so brilliant in October. But, after all, our knowledge is very limited. We all know individual Red Maples, which glow with an intenser scarlet than any of their fellows. It is not at all improbable that if these individuals were propagated, a race or strain of each species could be established in which this peculiarity would become a fixed habit and enable us to a show a mass of Oaks or Maples that would be almost dazzling in the splendor of their foliage. But, on the other hand, these colors may be due to certain soil conditions, and cions of these exceptional trees when grafted on other roots might fail

to kindle into the glowing colors of the parent stock. Would it not be well for nurserymen to find practical answers to such questions as this? Such experiments might be carried still further, and a test could be made with trees propagated from an individual branch whose foliage is known to change every year at an earlier period or to a brighter color than is the case with the rest of the tree. Here are definite points inviting study, and the facts which are ascertainable might help us to enhance the beauty of our parks and gardens for several weeks every year.

Pinus ponderosa.

THE Western Yellow Pine, or Pinus ponderosa, is the most widely distributed Pine-tree of the mountain forests of western North America, where it is distributed from the interior of British Columbia, from about latitude fifty-seven degrees north, southward to Mexico and eastward to northern Nebraska, the foot-hills of the Rocky Mountains of Colorado, and western Texas. Usually an inhabitant of dry elevated slopes, where it often forms open forests of great extent, it flourishes also on the western slopes of the Sierra Nevada, in the comparatively humid climate of northern California, where it attains its largest size, and in California also grows occasionally in wet and swampy ground. It is the only Pine-tree of Nebraska, and is very abundant on the Black Hills of Dakota; in northern Montana it forms a great forest in the valley of the Flat Head Lake and ranges westward to the shores of Puget Sound; it dots the slopes of the eastern foot-hills of the Rocky Mountains of Colorado, and clothes the divide between the Platte and Arkansas rivers with a forest pushed far out over the plain. Abundant in similar situations in Utah and common on the eastern slopes of the Sierras, where it attains a great size and beauty, Pinus ponderosa has found the climatic conditions of the Great Basin too severe for it, and it does not occur on the mountain ranges of central and southern Nevada. The Colorado plateau, which has an area of many thousand square miles in southern Colorado and Utah and in northern Mexico and Arizona, is covered with a forest of this tree. This is now the greatest uninterrupted Pine forest of the continent, and probably the largest in the world. South of the Colorado plateau the desert is broken up into short ranges of mountains, and on them, on both sides of the Mexican boundary, Pinus ponderosa is a common tree, as it is on the mountains of western Texas. A tree of such enormous range over a region of so many different climates has naturally developed many forms, and no other American Pine-tree varies more in size and habit, in the character of bark, length of leaves and size of cones. Sometimes it is fully three hundred feet tall, with a trunk fifteen feet in diameter, covered with bright cinnamon-red bark, broken into great plates, and sometimes it attains with difficulty the height of fifty feet, and its bark is nearly black and deeply furrowed. Such variations in the character of the bark are not always due to climate, however, and individuals with the red bark of the California tree and the black bark of the inhabitant of the arid slopes of the Colorado Mountains stand side by side in northern Arizona to the discouragement of the botanist anxious to understand this tree and the causes of its variations.

One hundred photographs would not be too many to properly illustrate the appearance of Pinus ponderosa in the different parts of the country which it inhabits, and an attempt to describe its different forms with any words at our command would be hopeless. Certain characters which botanists consider valuable specifically can be found in all the forms, so that it is most convenient to consider them all geographical varieties of one species, although in size and general appearance and in the character and value of the timber produced they are as distinct as many of the recognized species of our Pines.

The beautiful photographs of the Sierra forests often seen in the east have, no doubt, made the appearances of this tree, as it grows in its best estate, familiar to many of our readers, but the illustration on page 395 of this issue, made from a photograph for which we are indebted to Dr. W. H. Rollins, of Boston, shows the habit of a group of several young trees of this species, probably one hundred feet high, growing in the Yosemite Valley.

Autumnal Changes in Leaves.—II.

A GREEN leaf, or an alcoholic extract of one, viewed through a spectroscope, shows a band of light, or spectrum, which is very characteristic; its dark intervals or absorption bands, resembling those of no other substance. If, now, we mix benzine with our green solution of chlorophyll which we have obtained by soaking, say, Elm leaves in alcohol, the liquid separates into two layers, the upper of bluish-green benzine and the lower of yellow alcohol. These two solutions give different spectra, proving them different substances. Our chlorophyll, then, was a mixture of at least two substances, or, more likely, a chemical compound which broke into two of its constituent compounds, the yellow one being called xanthophyll. Now, this separation presumably occurs when green leaves turn yellow, as is suggested by a simple experiment. If our alcoholic extraction from Elm leaves has not been kept in darkness and sealed from the oxygen of the air, it has rapidly decomposed, turning from green to yellow—that is, the green constituent fades away first, gradually revealing the yellow one which, by the way, some consider the equivalent of the etiolin that always precedes the first formation of the green pigment.

Chlorophyll, however, is not simply reducible into two components, a green and a yellow, but into several more which it might be tedious and confusing to describe in detail. Over a score of distinct pigments exist in leaves. We may say, though, that an acid added to our original bright green extract turns it to a dull yellowish-green solution giving a new spectrum, and the same change, doubtless, occurs in the Grape leaf and others naturally containing free acid.

Returning once more to our alcoholic solution of chlorophyll, let us evaporate it to a green residue to which we will add water. The water dissolves out a gold-yellow substance which cannot be erythrophyll, for that is insoluble in water, besides having a different spectrum as well as another shade of yellow. This gold-yellow substance, whose name we had better omit, is very prevalent in autumnal leaves of Elm, Poplar, Milkweed and many more, occurring in four or five varieties, as distinguished by their optical properties. It is not always found, though, whereas xanthophyll invariably accompanies chlorophyll. A solution of this gold-yellow pigment in water may readily be oxidized by artificial means into substances with different shades of brown, and the oxygen of air, doubtless, accomplishes the same effect in leaves of Elm, Buttonwood, Beech and many more.

The red colors now remain for consideration. Microscopic examination of a thin cross-section of a red leaf of Japanese Ampelopsis shows that while the bounding wall of each leaf-cell is lined with colorless protoplasm embedded with green chlorophyll granules, the interior of each cell is occupied by a bright lake-red fluid. This cell-sap, as it is called, is mostly water in which is dissolved the red pigment, erythrophyll, if we may add one more technical term. We may obtain this pigment from Ampelopsis, Maple, Huckleberry and other leaves which turn red by boiling them in water, which dissolves out the erythrophyll, rendered impure, however, by more or less of the gold-yellow pigment already referred to. Evaporating the solution gives a red gum-like solid which is found in many of the so-called evergreen leaves that are red. Winter leaves of Cranberry soon lose their water by evaporation and precipitate in each cell a solid mass consisting almost wholly of tannin, either colorless, yellow or colored red by erythrophyll. Tannic acid accumulates in leaves, especially

of Oak, Beech and Sumach, as a probable waste product, and, though almost colorless, is capable of oxidation into bright yellow, red and brown pigments. Now, it is easily verifiable that all leaves red with erythrophyll contain abundant tannin. Not only that, the two substances are closely associated. Although erythrophyll might be formed by the disintegration of chlorophyll, it often appears independent of that substance, and might also be regarded a derivative of tannic acid by oxygen and light. It is only formed in sunlight and first appears in the exposed tips and stems of leaves, as indicated by their color. Again, it is not formed until leaves are in a state of low vitality. A green Sorrel leaf stuck into moist sand has its under side reddened if exposed to sunlight, but not if shaded. When a healthy leaf of White Oak is torn or punctured by an insect or artificially, the wound in either case soon becomes prematurely edged with the maroon of autumn. In the case of the Sorrel, sunlight opens widely the stomata, which mechanically regulate the normal escape of water from the under, shaded side of most leaves. The same uncontrolled evaporation occurs from a punctured Oak leaf. If evaporation is too rapid, however, a leaf dies green without assuming its autumn colors. An abnormal loss of water from the leaves not being replaced fast enough by the roots, implies a loss of vital power and a lessened ability to counteract forces of decomposition.

Weakened vitality, as need hardly be said, is always a necessary preliminary to the autumnal coloration of leaves. Aside from local influences of insects, fungi, soil and other things, all plants suffer a decrease of vitality from the yearly depression of temperature, assisted oftentimes by continued drought. We must not think of chlorophyll as formed once for all in spring and remaining permanent until autumn, but must consider it in constant decomposition and reconstruction, its constituent pigments not only existing in varying relative and absolute amount in different leaves, explaining the diverse colors and shades of different plants, but also occurring in varying proportion in any individual leaf, according to the equilibrium between the constructive and destructive forces in the plant. When this balance is fatally destroyed, as by falling temperature, green pigments are killed by the very solar energy which created them, and previously existing yellows and reds are revealed, or may also be formed in increased amount. Continued action of oxygen, heat and light reduces bright pigments to brown ones, by whose decay valuable mineral matters are returned to the soil.

I have now described in some detail the more important of the many pigments found in leaves and the colors they separately produce, but we must remember that almost any autumn leaf contains not one, but several, distinct pigments, the temporarily predominating one giving the leaf its color. The Red Maple is a good case in point. The yellow gradually creeps from the edges toward the large veins, and has not gone far before the edges shade from orange into crimson, which also works toward the veins. These are the last to turn, often appearing green against a striking yellow or red ground. Again, some Ampelopsis leaves are very dark, yet reveal by the microscope a distinct green pigment and a separate red one. The former absorbs the red rays of the solar spectrum, and the latter the complementary green rays, so that little light is transmitted to the eye, and the leaf looks almost black. Purple Beech leaves show the same thing, but with an excess of the red pigment. In the beet, erythrophyll is a normal, if useless, constituent; but it does not appear in a Blueberry-leaf until the green has given place to yellow; then yellow and red combine optically into brilliant orange and scarlet colors. Purple Beech leaves are never scarlet simply because the red erythrophyll decomposes before the green chlorophyll does, and the same may be said of many other potentially brilliant leaves; yet we ought to be satisfied with the color display nature already gives us.

Endeavoring to explain the principles which underlie this complex subject I cannot do better than to reproduce a table by Mr. Sorby, who has made the deepest and most trustworthy researches into vegetable coloring matters:

Complete vitality and growth.	Chrysophyll (gold-yellow).	More or less bright green.
	Chlorophyll (deep green).	More or less green-brown.
Low vitality and change.	Erythrophyll (crimson-red).	More or less red-scarlet.
	Xanthophyll (bright yellow).	More or less bright orange-brown.
Death and decomposition.	Phaiophyll (brown-orange).	Less or more dull brown.
	Humus (brown-black).	

This table gives the shades peculiar to the more important groups of leaf-pigments as classified by Mr. Sorby, and the tints resulting from some of their combinations, as well as the relative vitality of leaves approximately expressed by their colors.

We find all transitions between leaves which die at autumn and those which are again capable of assimilation after persisting dormant over winter. Such so-called evergreen leaves are always provided with an unusually thick and smooth epidermis to protect the chlorophyll grains within. This chlorophyll remains perfectly green during a mild winter, although the leaf may appear red from an abundance of erythrophyll overlying and hiding the green granules, which have retreated inward; or the green may fade away, as in autumn, leaving yellow granules of xanthophyll, and unless vitality is further reduced and the yellow oxidized into brown, such yellow leaves will again become green in the warm days of early spring, and will give the plant a start until the new year's buds have opened.

Here is a good place to tell why leaves fall. Sir Isaac Newton was possibly not aware that his apple fell because it was pushed. Of course, that was not pertinent to his train of thought, although strictly true, for fruits as well as leaves are severed from the plant by a "separating layer." Early in summer a layer of tissue begins to form across the base of each leaf-stalk where it joins the stem. This layer grows down like a wedge from the upper angle of leaf and stem. At first it is soft and does not resist the passage of water, but as winter approaches the layer becomes corky like the rest of the bark of which it is a part. It results that when the leaf, weighted with accumulated mineral matters and strained by frost, wind and rain, finally falls, no raw wound is left, but a scar already healed.

Here is an exquisite adaptation by which water passages are literally "corked up" in anticipation of the fall of leaves that have outlived their usefulness. As this separating layer gradually shuts out nutritious fluids from the leaf, the latter naturally becomes more and more of a prey to decomposing agencies. Yet, before a leaf falls, all its useful contents, like starch, potash and phosphoric acid, travel through the stem into the bark and young wood, as Sachs has clearly shown, to be stored for future need; the leaf is then rejected as of no more use, and its decomposition cannot affect the plant as a whole.

So the colors of autumn leaves are not adaptations for beneficial purposes like the colors of flowers, but are incidental, unaimed at and a wholesale waste of beauty, so far as concerns plants themselves. We must mention, however, that the pigments of many, not all, petals and fruits cannot be distinguished from those of autumn leaves—an additional evidence of similar origin and an example of the adaptation of useless structures to useful purposes, as occurs in other biological fields.

If this unæsthetic explanation of autumn colors sacrifices any poetic sentiment, we can recall the fact that no leaf falls without revealing a bud, the promise of a future manifestation of life.

Cambridge, Mass. *Justus Watson Folsom.*

The frosts come to ripen late September days as they ripen a persimmon. Just before sunset a thin haze in the air bathes the mountains on the western horizon with a purple tinge, like the bloom on a fruit. It is a phenomenon which follows the frost, and is an evidence that the year is ripe.—*Thoreau.*

Foreign Correspondence.

London Letter.

BY the middle of September we begin to notice the touch of approaching autumn here in the aspect of gardens, and already we see the brightening tints of ripening foliage. To-day I noticed in the Kew Arboretum crimson and golden hues developing on many trees and shrubs, chiefly those of American origin. The Tupelo is growing ruddy, and the Missouri Currant is a mass of crimson and gold. The Liquidambers, Azaleas and Vacciniums will presently give us a hint of an American autumn, and upon these rich colors planters must rely for effects in country places at a season when the owners are there. Of flowers, too, there is no lack. The abundance of autumn bloom this year is surprising, and no place excels the displays at Kew, where the warm gravelly soil has been greatly benefited by the heavy rains of the past month. The most striking features just now are the Japanese Lilies, particularly Lilium speciosum and L. auratum. These are planted freely in broad masses which rise out of Rhododendron or other evergreen shrub-growth. The shrubs make a foil for the flowers, and the damp soil required by the shrubs suits the Lilies. The golden-banded Lilies are especially luxuriant this year. They were grown from bulbs imported direct from Japan, and planted so late as May. The selected bulbs represent the variety known as Broad-leaved or Platyphyllum, though they may be only extra-vigorous seedlings of the common L. auratum selected with care and cultivated as in the Lily-fields about Yokohama. Whatever the origin of this vigorous form, it should always be obtained, if possible. The mass of these Lilies at Kew is of even height, and does not exceed three feet. The stems are stout and the leaves broad and strongly ribbed. Each plant carries from one to four flowers nearly a foot across the outspread sepals, which are of thick and firm texture, and withstand stormy weather better than those of the ordinary form. The flowers vary from those heavily spotted and blotched to spotless forms with broad bands of golden-yellow down each sepal. This mass will grow much taller and bear more flowers, but, considering the time it has been planted, the result is remarkable. The soil is a deep peat, mixed with leaf-mold and sand to suit the Rhododendrons among which they are planted, and the position is open and only moderately sheltered.

The Tea and China Roses are as remarkable as the Lilies. Among the Tea Roses in abundant second bloom are Marie Van Houtte, Perle des Jardins, Madame Berard, The Bride, Comtesse Riza du Parc, Madame de Watteville, Hon. E. Gifford, Marie d'Orleans, Madame Lambard, Madame Hoste, Jean Ducher and Doctor Grill, a dozen first-rate kinds that have proved to be the most satisfactory for September bloom about London and southward. The China Roses may well be termed perpetual bloomers, for they have been in continuous flowering since the middle of May, and are now more crowded with flowers than earlier in the season. They may be seen at Kew in large masses fifteen and twenty feet across. They are most effective in masses, as the flowers individually are not showy, compared with the Tea and hybrid Perpetual Roses. The best are Camoens, Laurette Messiny, the old Fellenberg, Jean Siseley, Cramoisi-Superieure, White Fairy, and White Pet and Red Pet. The last three are thickly set with buds and will continue to flower for another month.

At the Royal Horticultural show at Chiswick this week, Messrs. Paul, of Waltham Cross, showed a large collection of Roses that may be relied upon for September and October flowering, if frosts are not severe. Besides those already named, their collection included such fine sorts as Mrs. John Laing, one of the best autumn Roses of its color, and the flowers were of as good quality and size as in July; Countess of Pembroke, another of Bennett's hybrids, and Augustine Guinoisseau, known as the White La France. These three kinds were particularly fine. One of the most beautiful of the miscellaneous sorts was the double White Rosa rugosa (Blanc double de Coubert). This is probably the purest white of all Roses, and there is a massiveness about the large semidouble flowers that makes it effective in contrast with the broad green foliage. The variety of R. rugosa called America is exciting a good deal of interest; its large crimson-lake flowers are brighter than the ordinary rugosa, but it does not seem to be very distinct from the original.

The show was mainly devoted to vegetables, but there were no new ones or any that were specially noteworthy. The floral exhibition was principally of Dahlias, which are the flowers of the season, and the principal cultivators of these flowers seem to have made an effort to surpass one another on this occasion. One collection, from Mr. Ware, of Tottenham, was fifty feet long by five feet deep, and all classes of the flower were represented. The prevailing fashion among Dahlias is for the Cactus-flowered sorts. They comprised two-thirds of the exhibits, and some of the new kinds were certainly beautiful. Nothing can excel in brilliancy the vermilion-scarlet novelty Miss Nightingale, the rich saturn-red of Mrs. Wilson Noble, and the glowing scarlet Miss Annie Jones. The committee considered these all worthy of awards of merit. Among the older yet not common Cactus sorts were the lovely delicata Minnie, pale pink; Miss Beck, pale orange-scarlet; Mrs. Francis Fell, white and pale yellow, and Mrs. Charles Turner, the latter the largest Cactus Dahlia I have seen and of a pure chrome-yellow. As a bold vase flower at this season nothing could be finer. There were some good new kinds among Pompon and show Dahlias, but nothing striking, and there seemed to be no new kinds in the decorative section. These, though not suitable for the exhibition table, are most effective in gardens if planted in bold masses, since the flowers stand up away from the foliage, unlike the partially hidden flowers of the Cactus sorts. The best among the decorative Dahlias is the brilliant scarlet Flambeau, or Glare of the Garden, as it is also called.

Only a few Orchids were shown, but these were choice and consisted of new hybrids from Messrs. Veitch, the result of the careful work of Mr. Seden. A certificate of the first class was voted to Lælio-Cattleya Clonia superba, a cross between L. elegans Turneri and C. Warscewiczii, which is undoubtedly one of the finest hybrid Orchids yet raised. The flowers are as large as those of C. Warscewiczii, with a similarly broad labellum, but of a more intense crimson, while the sepals, which stand out firmly, are more in the way of the Lælia, being of a rich rosy-purple, veined with a deeper hue. An award of merit was given to Lælio-Cattleya Eunonia, a cross between C. Gaskelliana and L. pumila Dayana. It has the dwarf compact growth of the latter parent. The flowers are much larger, with pale rose-pink sepals and an intense crimson lip, with an orange blotch and light-tinted margin. A similar award was voted to Lælio-Cattleya Parysatis, between C. Bowringiana and L. pumila. This has also the dwarf growth of L. pumila, with larger and finer flowers more richly colored. Lælio-Cattleya Nyssa purpurea, between C. Warscewiczii and L. crispa, is a beautiful hybrid with flowers larger than the typical L. crispa, and with the same characteristic white frill to the labellum. These four hybrids are the finest group that has been shown at one time by this firm. A very remarkable hybrid Cypripedium was also shown by Messrs. Veitch. It is the result of intercrossing C. Haynaldianum and C. Spicerianum, and has the characters of both parents strongly marked in the flower. The dorsal sepal is that of C. Spicerianum, but the lateral sepals are like those of C. Haynaldianum, while the lower sepals, instead of being joined in the usual way, are separate and stand at an angle between the lateral sepals and the upper ones. The lip is like that of C. Spicerianum. This singular and beautiful hybrid is named C. Carnusianum (Veitch's variety), and the committee was unanimous in voting it an award of merit. Another hybrid, called C. Melis, between C. Philippinense and C. villosum Boxalli, was not remarkable, as it was too much like the latter parent.

Kew. *W. Goldring.*

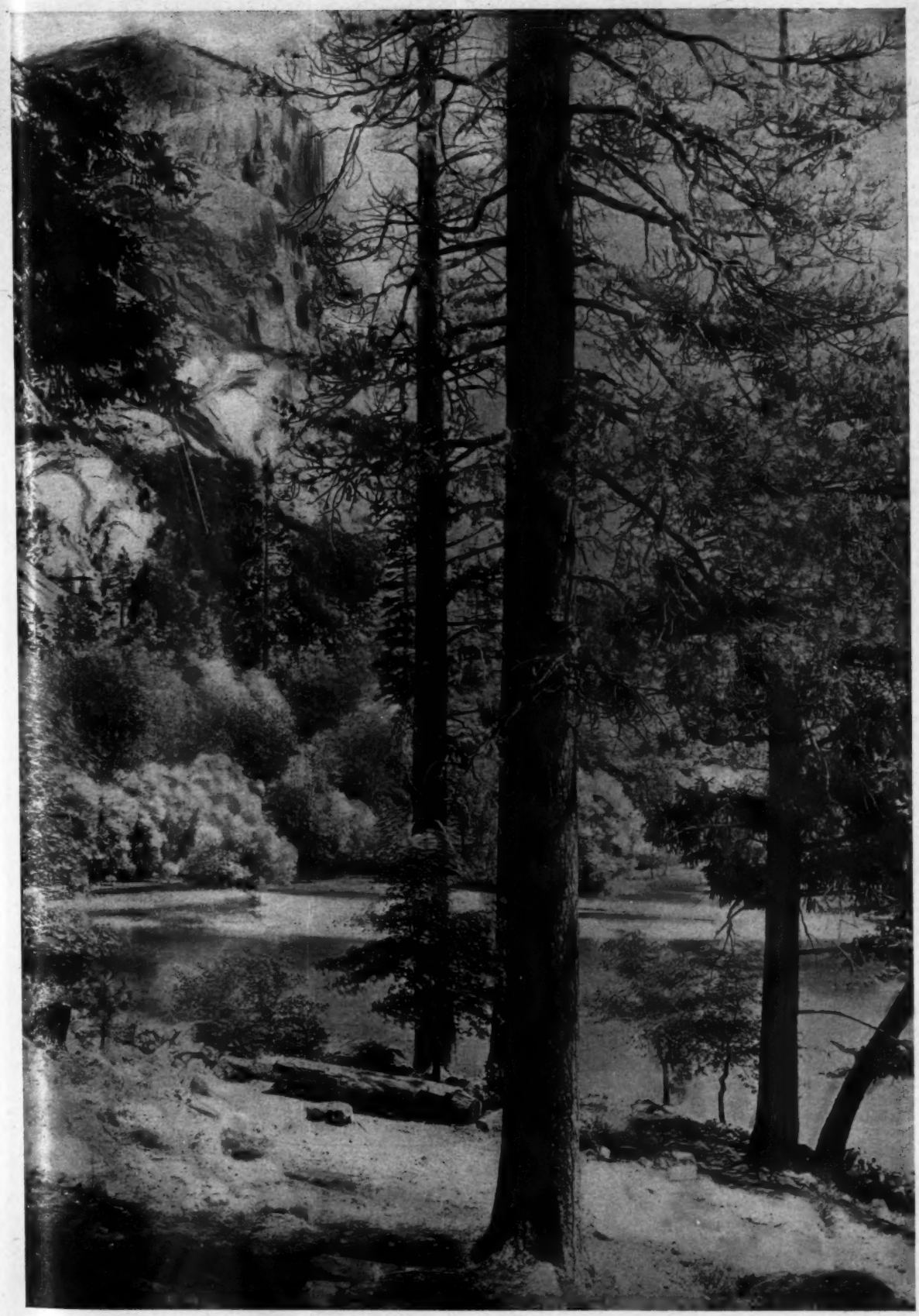

Fig. 54.—A group of young Pinus ponderosa in the Yosemite Valley.—See page 392.

Plant Notes.

Acer Pennsylvanicum.—The Striped Maple is one of our common small trees in the interior and mountainous parts of the Atlantic States, growing as far south as Georgia, and reaching its largest size on the Blue Ridge in the Carolinas and on the Big Smoky Mountains of Tennessee, where it is sometimes forty feet high, with a short stout trunk ten inches in diameter. Generally it is a much smaller tree, and often is little more than a large shrub. It derives its common name of Striped Maple from the pale or bluish white longitudinal striations on its reddish brown or green smooth bark, and we have no other hardy tree whose stems and branches are more delicately handsome, for, although some other Maples have more brightly colored branchlets, they lack its peculiar beauty of the main stem and large limbs. We rarely see good specimens in parks or private grounds, for it has been too much neglected by planters, but, when well grown, this Maple has a singularly neat habit, with light green summer foliage, attractive bud-scales and young leaves in early spring, and clear yellow leaves in autumn. The flowers, too, are graceful, hanging in long, drooping racemes. Altogether, it is an admirable tree for planting, like so many other of the smaller trees in our forest flora. The tree is also called the Moose Wood, because the deer browse in early spring on its young shoots, when they are filled with a sugary sap. Michaux found that when grafted on the Scyamore Maple it grew to a much larger size than when left on its own roots. The Japanese Acer rufinerve, which has been cultivated to a considerable extent, is so closely akin to the Moose Wood, botanically, that they can hardly be distinguished. Acer spicatum, our Mountain Maple, is a still smaller tree of more bushy habit, which we have often commended for large shrubberies. It is still more rarely grown than the Striped Maple. Its upright racemes of flowers and its bright red fruit in July are attractive features of this tree.

Callicarpa purpurea.—This shrub is just beginning to justify its generic name by the beauty of its clustered berry-like drupes which appear in the axils of every leaf. As seen in our parks just now, the branches, often three feet in length, arch over almost to the ground under the weight of violet-colored fruit, and this, together with its clean light green foliage, makes the plant worth using in parks or large places, wherever it is desirable to produce special autumn effects. The flowers open in mid-August here; they are lilac-purple, but small and inconspicuous, although rather interesting, on account of the time when they appear. This shrub, which grows to a height of four or five feet, is a native of Asia, but there is an American species of the genus found from Virginia southward along our coasts. It is not hardy as far north as New York, but where it will thrive its violet-colored fruit is even more handsome than that of its Asiatic relative. Callicarpa purpurea can be raised from seed, which is produced abundantly, and it will grow in almost any soil and with the simplest treatment.

Lilium Henryi.—This Lily was sent by Dr. Henry to Kew from China, where it flowered for the first time in 1889, and as soon as the plants became established it at once took rank among the best of Lilies for the garden. Mr. Nicholson wrote us, two years ago, that it would grow both in peat and loam, although it appears to gain a greater size when planted in loam. Mr. Orpet, who recently saw it flowering in Kew, writes that in habit and vigor it equals strong specimens of the Tiger Lily, and it has this Lily's umbellate habit of flowering and does not branch in an irregular way like L. speciosum. The flowers, however, resemble those of the latter species so closely in form that it has been called the yellow speciosum. The color is really apricot, with chocolate spots. Plants in the open border at Kew are more than seven feet high, many of them carrying thirty flower-buds each, and they presented a magnificent spectacle about the end of August. It is to be presumed that this Lily has now reached the full size it will attain at Kew, but when the bulbs are cheaper and have become more widely disseminated and tried under different conditions, it is possible that the plant will attain still larger proportions.

Cultural Department.

Late-blooming Hardy Herbaceous Plants.—I.

THE value of hardy herbaceous perennials is most noticeable at this season, for, in spite of the loss of tender plants, there is an abundance of hardy material to give an effective fall showing up to the time when the ground is frozen. Many hardy plants are not affected to a noticeable degree by frosts that would kill Geraniums. After two nights of hard frost that has killed all Squash and Tomato plants and has rendered unprotected Geraniums past further use, although no effects of the injury are seen in the foliage, the promise of bloom among hardy plants is still bright.

Achillea Ægyptica, A. millifolium, var. roseum, and A. serrata, Pearl, are throwing up quite a show of second bloom, and A. Eupatorium is displaying umbels of rich golden-yellow flowers from four to five inches across.

Alstrœmeria aurantiaca, the Peruvian Lily, still shows a wealth of its showy clusters of rich yellow, chocolate-striped flowers. Anchusa Italica, having been relieved of its seed-vessels before ripening, is giving many branched spikes of rich blue and white flowers resembling forget-me-nots. Anemone Japonica is at its best in all its pink, rosy purple, white and semidouble forms. Apios tuberosa, as a cultivated plant, is still producing its richly fragrant clusters of chocolate and red flowers. A single clump of Asclepias tuberosa (the Pleurisy-root) has been in bloom since mid-June, and shows no sign of stopping. Asperula odorata has taken on a second growth after the abundant rains, and there are enough flowers opening to spread its characteristic fragrance about.

Asters are in perfection, and these are some of the best: A. Sibiricus, a dwarf narrow-leaved species not exceeding a foot in height, forming a globular head covered with small clear lavender, starry flowers; A. longifolia, some three feet high, with rich deep bluish purple ray-flowers and well-defined bright yellow centres; A. Chapmanii, forming a bush some four feet high and quite as broad, with an open angular-branched habit and a profusion of fine clear blue flowers; A. Novæ-Angliæ, two to three feet in diameter, and just beginning to display its rich purple flowers by the hundred; its variety, Rosea, with a welcome contrast of color in its clear rosy red flowers while the varieties offered by the European nurserymen under the names of William Bowman and Constance are hardly distinguishable from the typical form; A. spectabilis, a splendid medium-growing species with broad, open, flat heads of large, rich, deep blue flowers; A. multiflorus, displaying myriads of minute white flowers in immense panicles; A. acris, just passed its season, but a plant not to be omitted from any good list of Asters because of its compact upright habit, being three to four feet high and not at all weedy, with clouds of well-formed pure white flowers each an inch across; A. grandiflorus, now forming buds for later bloom, and, although hard to grow into a specimen plant, its abundance of bloom so very late in the season and its individual flower-heads, an inch and a half across, of the richest deep blue color, give it great value; A. ptarmacoides, now past its best, after a brave show of small pure white flowers in densely branched heads; A. Novæ-Belgii, var. Lady Trevilyan, now at its best, with immense panicles of bloom often two feet and a half long and a foot to fifteen inches in diameter, each composed of innumerable pure white starry flowers.

Boltonia latisquama is a veritable queen among the autumn-blooming perennials, twelve-months-old clumps now giving masses of bloom fully five feet through, composed literally of myriads of rich clear lavender-pink flowers individually an inch and a half to two inches in diameter, and each on a clean wiry stem. Without exception, this can be given first place among the September-blooming perennials; the more commonly planted species, B. asteroides, with pure white flowers, does not give such great wealth of bloom, and the flowers are smaller, yet it is a showy plant.

Callirrhoë involucrata, the Poppy-mallow, has not been out of bloom since early June, and continues to throw out fresh shoots and an abundance of rich velvety purple buds opening to rich reddish purple, cup-shaped flowers an inch and a half across. Catananche cœrulea, in all its forms of clear purple, blue, purple and white and pure white flowers, has started afresh, and Cedronella cana is in perfection with its long

spikes of rich purple, pungently fragrant tubular flowers, the plant forming a bush three feet high and nearly as much in diameter. Centaurea montana and its red and white varieties, particularly the latter, are giving occasional flowers, which are eagerly sought for bouquets. Chelone Lyonii is just passing its best, but it continues a conspicuous object, forming strong bushy specimens three feet high and quite as broad, with rich green foliage to set off its dense heads of showy reddish purple flowers. This can be reckoned among the best of the late summer and early autumn bloomers. C. obliqua, var. alba, both in the garden and in its native meadow localities, makes a fine show in spite of the cold nights it so bravely endures.

The early-blooming Chrysanthemums are now making a good effect, particularly such of the earliest forms as Golden Fleece, bright yellow, double, and La Petite Marie, double, white, tinged with pink in fading. Captain Nemo, rich purple; Luxemburg, bronzy red; Precocité, yellow; Souvenir d'une Amie, snow-white, and St. Croix, white, tipped with pink, are just beginning to open, and they will bloom until the ground freezes hard.

Clematis crispa is still opening its wax-like, bell-shaped, lilac-colored flowers, and Conoclinium cœlestinum, the Mist Plant, is in perfection, forming spreading clumps a foot and a half high, with handsome foliage and every branchlet ending in a cluster of rich blue Ageratum-like flowers. Coreopsis lanceolata, C. grandiflora and C. tripteris are now giving ample second bloom, and although not needed so much as in early summer, on account of the abundance of yellow flowers at this season, yet they are always desirable. Delphinium Chinensis and the hybrid Larkspurs, in all their forms, after being cut back to prevent them from seeding, are now again in bloom, with smaller spikes. Lespedeza Sieboldi is now in perfection, every one of its lithe branches arching under the weight of its pendulous racemes, of rich red and purple, and in one variety pure white, pea-shaped flowers. Dicentra spectabilis has been sending up a second and rather unseasonable bloom of late, but our old favorite, D. eximia, is still giving a brave effect of bloom to contrast with its handsomely cut foliage, always so useful with cut flowers, and its variety Multipinnata, with its fresh green, beautifully compound foliage, is a rich sight among the waning foliage of other ripening border plants.

Of the Gentians, G. alba and G. Andrewsii are now exceptionally good, making strong clumps two feet or less high, the former with showy clusters of creamy white flowers, the latter with rich purple-tipped white, closed flowers. Gypsophila repens still forms creeping masses of glaucous narrow foliage, with broad heads of white flowers tinged with pink; and Heliopsis lævis is throwing up a second growth of its orange-yellow flowers, while the form known as H. Pitcheriana, of dwarfer growth, is a marvel of beauty with its fine formed flowers of deep orange.

Tritomas, though barely coming under the head of hardy plants, but which, if properly treated, will prove such, now give some of our best garden effects in their towering spikes of crimson, vermilion, red and orange flowers, fading with age to shades of yellow. Lathyrus latifolius, the Perennial Pea, and its white variety show occasional flowers, the white form displaying more freely its dense clusters of pure white on stiff wiry stems, which make it one of the best for cutting purposes. Lepachys pinnata still makes some floral show with curiously drooping lemon-yellow petals, so oddly different from the rigidly upright habit of the plant.

Linaria Dalmatica has bloomed since early June and bids fair to continue until hard frost, a great improvement on the wild Butter and Eggs (Linaria vulgaris) of the roadsides, growing some two feet high and producing showy branched spikes of yellow and orange flowers. Lotus corniculatus is again displaying dense globular heads of bright yellow, orange-tipped flowers above its narrow-tufted foliage. Lobelia cardinalis is about past, but a few short spikes of rich cardinal flowers continue to make bright spots in the border. L. syphilitica is in perfection with its long showy spikes of rich, clear blue flowers. Lychnis Chalcedonica, in its double white and double scarlet forms, is making good second bloom; both are first-rate additions to hardy plants and superior to the typical form, growing slowly into spreading clumps three feet high. The double Campion, L. vespertina, after a short rest, is again flowering, and is a boon to the florist, with its wealth of fragrant, showy double white flowers.

Myosotis palustris, var. semperflorens, the ever-blooming Forget-me-not, has been in bloom since spring, but now that cool evenings are here is outdoing itself, forming broad-spreading clumps, with masses of showy, light blue, white and yellow eyed flowers. This is the most satisfactory of the perennial Forget-me-nots. Œnothera macrocarpa keeps up its constant succession of immense trumpet-shaped, fragrant, rich yellow flowers, individually three to four inches across. As a plant for the front of the border or for the rockery it is unexcelled and always attracts attention. Œ. speciosa also persists in producing pure white fragrant flowers and forms a bush 18 inches high and as much through. Unfortunately this requires considerable care to carry it through the winter.

Reading, Mass. *J. Woodward Manning.*

Autumn Garden Flowers.

THE unseasonably warm weather of the past fortnight has given a new lease of life to all autumn flowers. Seldom have the roadsides, hillsides and meadows been so bright at this season of the year. The native Asters and their allies, the Boltonias, are abundant everywhere, with late-blooming Sunflowers and Golden-rods in perfect harmony of color.

In the garden, with exotics to draw upon, we have still more variety. Gladioli and the late Japanese Plantain Lily have past early this season, but Dahlias, single and double, and especially the Pompon varieties, are at their best. So, also, are the common but showy double form of Helianthus decapetalus and the silver-leaved Texan Sunflower, Helianthus argophyllus, which is the best of all the annual Sunflowers. H. cucumerifolius is a neat variety and excellent for cutting; it blooms earlier and is beginning to look seedy now. Montbretias will hold on until frost, which always comes too soon, as many of our showiest plants begin to flower quite late in the season. Japan Anemones in the open ground are scarcely yet at their best. They would have flowered earlier if the crowns developed the previous season had not been winter-killed. Sometimes we are fortunate enough to have a few escape freezing, but usually new crowns have to be formed. We have yet to find a way of protecting them, as ordinary litter does not answer. Dryness at the roots seems the essential condition, as some few plants kept in a cold frame, with no more protection than shutters, came through just as safely as those stored in the barn-cellar. These plants when grown in large pots make excellent specimens for piazza decoration. They are now in full bloom.

During the flowering season of Clematis paniculata letters of inquiry are always received about the best way to raise this plant from seed. The seed should be sown in autumn rather than in spring. I have seen many plants raised in the open ground which had been sown in autumn and covered over winter with about one inch of litter. Light sandy soil a half inch deep is best for covering the seed. The seeds are slow in germinating, and may not be expected until the following July. The beds must be kept well watered the entire summer. Persons who have bought seed in spring have been disappointed in apparent failure to germinate. The seed may not come up until September, but if the soil is kept moist they are sure to come. The seed-bed should not be disturbed until the following spring; it should be covered with litter as before, but less deeply.

Cannas continue to flower well. There are none more beautiful than Souvenir d'Antoine Crozy, with its brilliant scarlet ground and wide border of deep yellow. Among the many exotic annuals few are as attractive as Vinca rosea and its white variety when used in mixed bedding. It is of neat and even growth, about eighteen inches in height, and never at any time unsightly. In order to succeed thoroughly with this plant the seeds should be sown in a warm greenhouse about midwinter. The plants will make no substantial growth until put into a hot-bed in March; bottom-heat seems necessary to start them into healthy growth.

Caryopteris mastacanthus, a reintroduced member of the Verbena family, and new to many of us, promises to be an excellent autumn bloomer. It makes a fine effect when massed. It is a neat bushy plant, evidently a subshrub, with self-supporting stems and handsome hoary foliage, being distinctly silvery on the under surface. The flowers are small, labiate, with a fringed lower lip, in fastigiate cymes in the axils of the opposite leaves, lavender-blue in color, and produced in great abundance. I have also grown C. mastacanthus as a pot-plant with good results. It may be quite easily increased from cuttings, and, no doubt, will soon be abundant.

Two plants which have pleased me much this summer are Malva alcea and Sidalcea candida, both near relatives of the Marsh Mallow. Malva alcea has handsome palmate leaves, and with a little training or trimming away of straggling shoots makes a splendid pyramidal specimen, blooming from June until frost. The flowers are rotate, slightly incurved, or saucer-shaped, and pink in color. The habit of the Sidalcea is somewhat similar, but it is taller, reaching six feet in height in rich

soil. The plant blooms later, and the flowers are slightly larger and pure white in color.

There are also several species of Hibiscus which, though coarse in habit, are very showy at this season. H. militaris, blush-white; the common H. moscheutos, rose, and H. coccineus, a southern species, are among the best. The Cardinal-flower, Lobelia cardinalis, is a splendid plant for late effect. Although naturally found growing in moist situations, it succeeds well in ordinary garden-soil, sowing itself freely on our rock-garden.

Wellesley, Mass. *T. D. Hatfield.*

Cannas.

TO an inquiry about the treatment of Cannas from autumn until bedding time, Mr. J. I. Donlan makes answer in *The Florists' Exchange*, from which we quote:

See that the Cannas are well attended to now; they require plenty of water, and once in a while some liquid-manure. Remove all faded leaves and flowers, and cut down to an inch above ground all the stalks that have bloomed; this relieves the plants of sustaining useless growth, and gives them a better chance to form healthy roots. See that all the varieties are properly labeled, and if there be any poor kinds throw them away; do not propagate varieties with inferior flowers. Leave Cannas out-of-doors as long as possible, or until the foliage is cut by frost; a little frost will do them no harm, provided it does not touch the roots, and Cannas make much of their most valuable growth during the cool, moist weather of late fall.

When lifting the roots be careful not to damage the tubers or eyes; shake the soil off and cut all the foliage down to three or four inches from the roots; pack all the roots closely together on a moist, sandy bottom, underneath any greenhouse bench, or in a cellar—anywhere where they will not get frozen or be dried out. Many gardeners lose their Cannas by putting them on dry shelves; the best place to store them is on a cool bottom, away from excessive dryness and continuous drips; they can be preserved in such a place for any length of time. A well-grown Canna should produce from seven to ten new eyes, and commercial growers usually are satisfied with this self-propagation, dividing the roots and selling the surplus all through the winter and spring, as the opportunity occurs.

Where, however, certain kinds are scarce, or it is desirable to work up stock of some new variety, then after the plants are taken up in the usual way all the good "eyes" are cut off and packed in shallow flat boxes with wet moss firmly pressed between them. If the box is placed where it will get a little bottom-heat the tubers will soon commence growing; then the new stock should be placed on a bench filled with rich soil and plenty of well-decayed manure in rows about eighteen inches each way. Give them the same treatment as American Beauty Roses require, with much more water. As the new tubers form, they can be cut off and treated as above, and when rooted they can be put into three-and-a-half-inch pots, shaded for a few days, after which they can be moved into larger pots or tubs, where they will make splendid decorative flowering plants.

If Cannas are started in this way, immediately after they are taken from the field, they should be in bloom at Christmas or New Year's, and can be kept in bloom all winter. If it be only desirable to get plants in good condition for spring planting they should be started in February, March or April. The growth can be regulated by temperature and moisture. If kept as near the glass as possible they will grow more stocky.

Cannas should never be planted out directly from winter storage. In order to get the best results they should be started and put in pots, from which they should be put into well-manured beds the last week of May or first of June.

Hypericum Moserianum.—All things considered, this appears to be the most desirable of the hardy Hypericums for garden culture, and there is little reason to doubt its hardiness, although it has not been tested here in a large way as yet. A large circular bed at Kew, in the decorative part of the grounds, was one of the principal features there this summer, and for massing in this way it is difficult to imagine anything more striking. The large yellow flowers are produced in great profusion for a long period, with a setting of healthy dark-green foliage below. As has already been explained in Garden and Forest, this plant is a garden hybrid between Hypericum patulum and H. calycinum, the old St. John's Wort, and in general appearance it resembles the latter, but has lost the coarseness that used to characterize that plant and relegate it to waste corners of the garden where nothing else would grow. At St. Albans, Messrs. Sander have a variegated sport of H. Moserianum called Tricolor, which will be highly prized when it is disseminated by all who admire plants with foliage of varied colors. The leaves of this plant are bright pink, white and green, and it has a vigor equal to that of the parent plant, with which it is identical, except for the color of the leaves. These should not burn in this climate as many highly colored sports are apt to do, since the texture is thick, almost leathery, and this ought to insure it against injury even in the hottest seasons. The happy idea of planting this Hypericum in masses, as carried out at Kew, is worthy of imitation, as individual plants, either of the type or of the sport, are quite inferior in effect to large groups.

South Lancaster, Mass. *E. O. Orpet.*

Correspondence.

Poisoning from Rhus.

To the Editor of Garden and Forest:

Sir,—I have been following with interest your articles on Rhus Toxicodendron, being a sufferer from its poisonous influences. The recent article from Professor Burrill has especially interested me, and has led me to add my own experiences.

When only eight years old, before I knew the properties of this plant, I was badly poisoned. I sat for nearly half an hour in the midst of its leaves and stems, and even whittled the wood. On the next day I was seriously poisoned, an experience which only those who have been similarly afflicted can appreciate. But the trouble was not finally over when the attack had run its course, and this note is to put on record a phase of the poisoning which I have not yet seen recorded.

For the remainder of the year I was well, but late in the spring of the following year, a little earlier in the season than the date of the first attack, I was again poisoned. It was supposed, of course, that I had again come in contact with the plant, for the symptoms were the same, only less severe. No plants, however, appeared to be growing in our neighborhood, and I could recall no ramble in which it was likely that I had been near one. I soon recovered from this attack, and the cause of it remained unknown. But the following year, at precisely the same season, the trouble again appeared, and no possible chance for new exposure could be imagined. There remained but little doubt that the cause of this attack was the severe poisoning of two years before. The disease was not serious, but sufficiently severe to be very troublesome. I am certain of the time of the year in which the attacks came, for in this and the preceding year the orioles were building their nests.

The fourth year the entire family were on the lookout for the disease. I was extremely careful not to come near the Ivy, for by this time I knew the plant and feared its properties. At the usual date, however, the effects of the poisoning were once more experienced, with nearly their past severity. The fifth year, and again the sixth the poisoning recurred, each time in somewhat less severe form. During the summer of my thirteenth year I had typhoid fever, which kept me an invalid until well into the fall. The following spring was passed without a trace of the Ivy poisoning, and the next year I again escaped the trouble. This was ascribed, correctly or otherwise, to the action of the fever, which is supposed sometimes to leave patients in better physical condition than before its appearance.

After two years of freedom I had little fear of poisoning and frequently passed close by the plant, even walking through patches of the low-growing form. I thought myself exempt from its influence, and to make sure rubbed a part of a leaf lightly upon the back of my hand. Of course I was poisoned, and in the following years the same experience was passed through. The attack invariably occurred upon the approach of warm weather, or after I had been overheated. In more recent years these effects seem to have left me entirely. Although susceptible to the influence of the plant when I touch it, I can approach it with impunity, and have often safely passed through large quantities of it when not coming into direct contact with it.

Whatever may be the cause of the disturbance, it has, in my case, regularly been brought into activity by change from cold to warm seasons. This was plainly shown in the winter of 1881, when I left Michigan early in January and went to Florida. I had scarcely been in the warm climate a week when the well-known symptoms made themselves manifest. The following spring they again returned.

I have noticed no mention of one painful concomitant of Ivy poisoning in my case, that is, the appearance of boils after

each attack, and the more severe the poisoning the greater their number.

Cornell University. *E. G. Lodeman.*

[We have received a letter from Mr. Joseph Meehan, of Germantown, in which he speaks of an exact repetition of Mr. Lodeman's case; that is, a friend of his in Philadelphia was poisoned badly by Rhus Toxicodendron when on a visit to the country, and for several years afterward at the same season of the year, even although he did not leave the city, the effects of the poison appeared again, severely at first, but in a less aggravated form from year to year, until it finally ceased to reappear. Mr. Meehan adds that he is convinced that he has suffered in the same way, although he cannot be absolutely certain that he was not exposed to the poison the second time.—ED.]

Glimpses of Ventura Gardens.

To the Editor of GARDEN AND FOREST:

Sir,—One of the most charming towns of the Pacific coast is Ventura, of old christened San Buena Ventura, and surely it was an especially good venture of the Franciscan Mission-builders that led them to this narrow crescent of sheltered land, sloping south to the Pacific and guarded from storms by mountains and islands. In the first week of September I visited the place and found it full of surprise and pleasure. No portion of California will better justify a horticultural pilgrimage.

Two Date Palms, planted by the priests, yet remain in the old garden of the Mission. The church-bell still stands in vines and trees, swinging from ancient cross-bars, and the old Mission building gives the quaint town a peculiar beauty of its own.

It is hard to say what trees and flowers do not thrive here, so surprising is the range of species. One passes a Ficus elastica tree, for instance, in an old garden; the tree is twenty-three years old, and it has a trunk that girths four and a half feet. The spread of its boughs covers a circle whose diameter is fifty-five feet, and it is twenty-five or thirty feet in height. It is a tree of astonishing beauty and form, and the town of Ventura should buy the ground so as to name and care for it.

The most attractive and interesting garden here is that of Mrs. Theodosia B. Shepherd, who is a well-known hybridizer of various flowers. The advantages of location are great, but she has shown uncommon skill in utilizing those advantages, and her name is now prominent among California growers and experimenters. One of the first things of importance I noticed here was her new Begonias. Mrs. Shepherd has a very large collection of fibrous-rooted species, and after numerous experiments is now rejoicing in a strain of attractive hybrids of Gloire de Jouy × rubra. This new production is really a race of giant Begonias, some of which send up canes six or eight feet high, with rich, lustrous, metallic leaves, often fifteen inches long by eight inches wide. The glossy and brilliant-hued flowers of immense size, far surpassing the parent types, hang down in long, open panicles of rose, rose-red or coral-red. Nothing could be finer for use as backgrounds in Begonia houses. Three varieties have been named Fair Rosamond, Heart's Delight and Modjeska. The Begonias are grown in the ground here, but are sheltered by lath-houses which shut off about one-fourth of the light at all seasons, and, being partly covered with delicate-leaved vines, at times shut out fully one-third of the sunlight. In more inland situations these lath-houses, or open sheds of slats, should shut out as much as one-half of the light. They are becoming more generally used in California gardens for Ferns and many classes of plants besides Begonias.

Growing out-of-doors, without protection, and flowering to perfection, I took especial note of the following vines: Bignonia venusta, B. magnifica, B. siderafolia and B. Tweediana; Bougainvillea glabra and B. spectabilis; Ipomœa Learii and many other Ipomœas; Passiflora incarnata, Tacsonia Von Volxemi, T. Buchanani and a noble Tacsonia which is possibly a cross between the scarlet and the pink varieties, called by Mrs. Shepherd, T. Sutherlandi. There is also a grand climbing Solanum from Mexico, one of the most picturesque of tropical vines. Nowhere else in California can be found finer specimens of some of these beautiful vines, and they form one of the most memorable features of the place.

A plant of Cereus triangularis, which has climbed to the top of the two-story house and far up the slope of the roof, has wide fame throughout California. Planted out in the garden are many of the finest Cacti. I noted two species of the spineless Anhalonium, eight species of Cereus, two of Echinopsis, six of Echinocereus, five of Echinocactus and many of other classes. Especial attention is being paid to the edible-fruited Cacti, and these, as well as others, are being crossed on a large scale, so that great numbers of seedlings are coming along.

All experiments are not made out-of-doors, however, even here. Several well-kept propagation-houses and greenhouses for tropical plants contain large collections. Some Orchids do well out-of-doors in summer hung against the trunks of trees. Lælia anceps has grown and bloomed for three winters in such a location.

Among the striking specimens here is a plant of Streptosolon Jamesoni, from Central America, an evergreen bush twelve feet high and fully as broad, which blooms from March to October. Its effective Browallia-shaped flowers of bright orange, changing to cinnabar-red, are produced in great profusion. There is an Erythrina Crista-Galli tree that stands about sixteen feet high, with branches covering a circle thirty feet in diameter, and a double trunk, either stem of which is ten or twelve inches in diameter. Nearly three acres in the home garden, and five or six acres in other parts of the town, are devoted to the growth of plants and seeds. I cannot even mention the new varieties of Fuchsias, Abutilons, Cannas, Gladioli, Cosmos and many other species of flowering plants which Mrs. Shepherd has originated here. She is working with tireless energy and passionate devotion, much as Luther Burbank, of Santa Rosa, works, and no other woman in California has done as much in this field.

Niles, Calif. *Charles Howard Shinn.*

Recent Publications.

Chrysanthemums and Their Culture. By Edwin Molyneux. London. 1894.

The American Chrysanthemum Manual for 1895. Michael Barker. Mayflower Publishing Co., Floral Park, New York.

The first of these books is the eighth edition of the standard work of Mr. Molyneux, who has done more, probably, than any other man to establish what is recognized as the best practical system of growing Chrysanthemums. This last edition of his book contains, in addition to the original text, lists of the newer varieties and gives some of the latest improvements in the methods of cultivating the plant. Of course, the book is written, primarily, for English gardens, but the rules for managing plants for various purposes, the methods of potting and training, together with all the other details of culture, will be found laid down here with clearness and with a freshness which distinguishes the work of an original investigator and experimenter. There are annual Chrysanthemum shows in every town of any size in England, and a first prize there is still a much-coveted honor. It is not wonderful, therefore, that a large portion of this book should be devoted to the methods of preparing plants and flowers for exhibition, and we are not surprised to see the pictures of forceps, brushes and other appliances for "improving" flowers that are to be exhibited, and a discussion as to the proper size of the tweezers and of the material out of which they should be constructed. We hardly consider operations of this sort an essential part of Chrysanthemum-growing, but no one who wants to familiarize himself with all the refinements of the art of growing and exhibiting the queen of autumn can afford to be without a copy of this well-known manual.

Mr. Barker's book is the first one of what promises to be a series of annual publications, and it is certainly well done. The book contains many things that are not worth putting on record, but it also contains much instruction by recognized experts. Such men as Edwin Lonsdale, E. G. Hill and William Tricker write about planting in beds and benches. Mr. T. D. Hatfield explains how he has trained the specimen plants with which he has so often won prizes in Boston. Professor Halsted writes of fungous diseases, while James Brydon, John Dyer, Grove P. Rawson, James Scott and John N. May discuss various phases in the cultivation of these plants, of which they are recognized masters. Mr. E. O. Orpet makes a sound plea for cultivating such neglected groups as the Anemone-flowered Chrysanthemums, and single-flowered ones like the variety called Daisy, which really

makes one of the most beautiful of flowering plants; and Mr. Patrick O'Mara, in the same strain, objects to estimating the value of varieties simply with regard to their fitness for cut flowers. "Horticulture," he writes, "is broader than the cut-flower market," and there is room without crowding out the cut-flower varieties for others with pompon flowers, single flowers, tasselled flowers and other quaint forms. It is true that the most perfect flowers and plants can only be raised under glass, but there are still many varieties which will endure the chill of early frosts, and we agree with Mr. O'Mara that there is no more suitable ornament for the outdoor garden than these sturdy varieties, whose flowers of yellow and white and pink and bronze harmonize so perfectly with the autumn colors about them.

Notes.

Good plants of the Rose Madame Georges Bruant are now bearing their pure white flowers with considerable freedom, and, indeed, there has hardly been a day throughout the summer when this plant did not show some flowers. Few people who are acquainted with it will dissent from the opinion expressed in *Meehans' Monthly* that this hybrid of Rosa rugosa is one of the best horticultural acquisitions of recent years.

Mr. Merritt Fernald, of the Gray Herbarium, prints, in the *Proceedings of the Boston Society of Natural History*, a supplement to the catalogue of the plants in that state published in 1892. Sixteen hundred and fifty-six species and varieties of flowering plants and ferns, native and naturalized, are now credited to the flora of Maine. In the last edition of the Maine catalogue 1,578 species were included; from these Mr. Fernald now drops seventy-seven species and adds 155 species not credited before to the state.

Last week the Rhode Island Horticultural Society celebrated its fiftieth anniversary with fitting exercises, both social and literary. Mr. Amasa M. Eaton read an historical paper of permanent value, giving, in addition to sound counsel as to the legitimate purpose of such a society, a brief sketch of the work which it had already accomplished in various fields, with some account of the many public-spirited men and women who have helped to make it useful. Governor Lippitt, Professor Henry L. Parker, of the Worcester County Horticultural Association, Miss Sarah Doyle, Hon. John N. Washburne, of the Kingston College, and others made suitable addresses.

Dr. Ephraim W. Bull, the originator of the Concord Grape, died at Concord, Massachusetts, on the 27th of September, in his ninetieth year. Dr. Bull studied and practiced medicine in the city of Boston until failing health compelled him to remove to Concord, where he lived the remainder of his life. He will long be remembered as the introducer of the Concord Grape, which he exhibited for the first time in 1853 at the twenty-fifth annual exhibition of the Massachusetts Horticultural Society, and which has become the most popular grape in America. While not a Grape of the finest quality, its hardiness, vigor, productiveness, appearance and adaptability to various soils and situations have caused it to be planted so generally that more Concord grapes are grown and marketed than all other sorts combined. The Cottage, Esther, Rockwood and Una are other varieties of merit for which the grape-growers of the country are indebted to Dr. Bull.

An exhibition of Cannas was made by the New York Florists' Club on Monday evening of last week, and it proved very interesting in spite of the hot weather under which the flowers refused to stand up any length of time. All the standard varieties were displayed in excellent form. Among the newer kinds of superior quality which we observed was Mrs. Fairman Rogers, exhibited by Mr. James F. Cowles, of Newport, which had a singularly compact truss of bright scarlet flowers with yellow-edged petals. Eldorado and F. R. Pierson were the best of those exhibited by F. R. Pierson & Co., and there was an unnamed seedling with exceedingly dark-colored leaves. Among the seedlings shown by James Dean, of Bay Ridge, the bright yellow Orienta attracted the most attention, although Defender and Embla were strikingly good. Peter Henderson & Co. also made a fine display, as did Siebrecht & Wadley, and John White, of Elizabeth, New Jersey, whose seedling Golden Queen, with richly variegated leaves, is distinct and beautiful.

The latest plums of the season, now nearly ended, are Ickworth Imperatrice, a purple fruit with irregular streaks of fawn color, one of the best for shipping and keeping qualities, the greenish yellow flesh being sweet and rich in flavor; Silver prune, large, almost translucent, and valued highly for drying; the large German prune, its purple skin covered with abundant blue bloom, and Coe's Late Red, which is seen here as late as February. Bilyeus Late October peaches, large white-flesh free-stones, are now coming from California, with Salways and Honey Clings. With the season for Bartletts ended, Doyenne du Comice, Forelle, Winter Nelis and P. Barry now make up the California shipments of pears. The Forelle, known also as the German Trout pear, is especially beautiful, full-grown specimens being long, bell-shaped, the color a clear bright-yellow, with brilliant red cheek. Choice Majori lemons have recently realized the extreme price of $12.50 a box, so that the retailers' price of $1.00 a dozen is not excessive. Grape-fruit, in considerable quantities and of good quality, is coming from Jamaica, and retails at ten cents each.

Monsieur Lemoine, of Nancy, sends us photographs of a new Deutzia raised by him by crossing D. gracilis and. D. parviflora, and described as D. Lemoinei in the Bulletin of the National Society of France, which awarded to it in August last year, when it was first exhibited in Paris, a certificate of merit of the first class. In 1891 Monsieur Lemoine fertilized the flowers of D. parviflora with the pollen of D. gracilis and obtained from this cross a number of individuals which have proved perfectly hardy during the last three winters. They form dense bushes now more than two and a half feet high, with erect branches which cover themselves with flowers early in May. D. Lemoinei is described as intermediate between the two parents; the branches are more erect and solid than those of D. gracilis, the pollen parent, and are more regular, shorter, and more numerous than those of D. parviflora, the seed parent. The flowers, which are produced more regularly than on D. parviflora, are borne in hemispherical or cone-shaped panicles, composed of from fifteen to twenty-five flowers nearly an inch in diameter when expanded. The petals are large, oval, with undulate margins, and pure white. It is suggested that D. Lemoinei will be an excellent subject for forcing. It is probable that this interesting plant has not yet been tried in this country. The photographs with which Monsieur Lemoine has favored us show plants covered with flowers and of good habit.

About five years ago Professor H. L. Bolley demonstrated that Potato scab was caused by a minute vegetable parasite, and although Dr. Thaxter a short time later announced the discovery of another organism, Oospora scabies, which was capable of producing scab and which is considered the chief cause of the trouble, the practical conclusions drawn from Professor Bolley's studies were valid, and they were noteworthy as an example of a proposed remedy based strictly on the scientific investigation of the cause of the disease. This disease attacks the crop through infected tubers, and Professor Bolley showed that if these are immersed in a corrosive sublimate solution of the strength of one in a thousand, that is, two ounces to fifteen gallons of water, the crop will be essentially free from surface blemishes and have a greater market value. Dr. J. C. Arthur, botanist of the Purdue Experiment Station, has lately issued an interesting bulletin on this subject, giving the result of three years' trials of the corrosive sublimate treatment, and these trials, taken separately or collectively, establish the efficient character of the remedy. The treatment is easy and cheap. The poison should be dissolved in a small amount of hot water in an earthenware dish and the solution added to the water in a wooden cask. The bath should be about an hour and a half long, although some variation in the time is immaterial. A glass or earthenware vessel may be used for disinfecting a few tubers, but vessels of iron, tin or copper should never be used. The solution may be poured off and used over and over again as dirt does not injure it. Of course, great care must be exercised with so deadly a poison. It ought to be added, perhaps, that Dr. Arthur makes no mention of the researches of Professor Hopkins, which seem to have shown that certain fungus gnats are able to inflict injuries upon potatoes which resemble the scab, and that he considers it probable that much of the loss from imperfect potatoes is due to them. Without making a study of the causes of this disease, Professor Halsted has also been experimenting on the New Jersey Agricultural College farm with sulphur as a remedy, using upon one plot the flowers of sulphur at the rate of three hundred pounds per acre. The freshly cut tubers used for seed were rolled in sulphur, and the rest of it was sprinkled in the open row at planting time. In this plot the potatoes came out practically free from disease, while in the adjoining plots, treated in exactly the same way, except that the sulphur was omitted, all or nearly all of the potatoes were scabbed.